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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,619	12/27/2003	Vladimir S. Moxson		7498

7590 08/13/2010
ADVANCE MATERIALS PRODUCTS, INC.
1890 GEORGETOWN ROAD
HUDSON, OH 44236

EXAMINER

ZHU, WEIPING

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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08/13/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/748,619

Applicant(s)

MOXSON ET AL

Examiner

WEIPING ZHU

Art Unit

1793

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2, 3, 5-14, 17, 19, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) 5-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2, 3, 17, 19, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 6, 2010 has been entered.

Status of Claims

2. Claims 2, 3, 17, 19, 21 and 22 are currently under examination wherein claim 21 has been amended in applicant's amendment filed on May 6, 2010.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 2, 3, 17, 19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brupbacher et al. (US 5,059,490) in view of Gottselig et al. (US 4,961,529) and further in view of Kugler (US 4,410,412).

With respect to claim 21, Brupbacher et al. ('490) discloses a fully-dense discontinuously-reinforced titanium matrix composite material having superior physical and mechanical properties including high compressive properties, high fracture

toughness and excellent creep characteristics comprising (col. 1, lines 25-43, col. 3, lines 23-58, col. 4 lines 3-50 and col. 4, line 63 to col. 5, line 8, col. 7, line 3 to col. 9, line 49):

- a. a matrix of a titanium alloy;
- b. ceramic and/or intermetallic hard particles dispersed in the matrix comprising SiC, TiC, ZrC, TaC, WC, NbC and intermetallic compounds of various metals including Al, Ti, Si, Mo, W, Nb, V, Zr, Cr, Hf, Co Ni and Fe present as desired in the matrix;
- c. complex carbide particles comprising Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W separately provided in a reaction mixture that are at least partially soluble in the matrix at the sintering or forging temperature such as TiVC dispersed in the matrix; and
- d. complex carbide-aluminide particles such as TiVC/TiAl, suggesting the claimed complex carbide-aluminide particles of Al_4SiC_4 , Al_4SiC_4 or Al_4SiC_4 would be formed in the presence of SiC and Al during the direct synthesis process of Brupbacher et al. ('490).

Brupbacher et al. ('490) does not specify the presence of the complex carbide-silicide particles in the titanium matrix composite material as claimed. Gottselig et al. ('529) discloses forming Ti_3SiC_2 by reacting Ti with SiC (abstract). It would have been obvious to one of ordinary skill in the art that during the direct synthesis process of Brupbacher et al. ('490), the claimed Ti_3SiC_2 would be formed in the presence of SiC and Ti as evidenced by Gottselig et al. ('529) (abstract). Brupbacher et al. ('490) does

not specify the amounts of the ceramic and/or intermetallic hard particles as claimed. However, Brupbacher et al. ('490) discloses that the total ceramic whisker loadings range from less than 5 to greater than 90 volume percents (col. 4, lines 3-10), which overlaps the claimed ranges. A prima facie case of obviousness exists. See MPEP 2144.05 I.

Brupbacher et al. ('490) in view of Gottselig et al. ('529) does not disclose the presence of the intermetallic compound of Al_8V_5 in the titanium matrix composite material as claimed. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the carbides of Brupbacher et al. ('490) in view of Gottselig et al. ('529) (e.g. TiC) with the claimed Al_8V_5 in the titanium matrix composite material of Brupbacher et al. ('490) in view of Gottselig et al. ('529) with an expectation of success, because the carbides and Al_8V_5 are functionally equivalent in terms of being used to make solid ceramic or intermetallic cathodes as disclosed by Kugler ('412) (col. 1, lines 34-40 and Example 2). See MPEP 2144.06.

The properties of the fully-dense discontinuously-reinforced titanium matrix composite material disclosed by Brupbacher et al. ('490) appear to read on the properties as claimed in the instant claim 21. It would have been obvious to one of ordinary skill in the art that the mechanical and other properties of claimed and Brupbacher et al. ('490) in view of Gottselig et al. ('529) and further in view of Kugler ('412)'s discontinuously-reinforced titanium matrix composite materials would be similar because the similarities in compositions and processes of making between the materials.

With respect to claim 2, Brupbacher et al. ('490) discloses that the porosity in the composite material can be eliminated (col. 8, lines 1-15), which reads on the claimed feature.

With respect to claim 3, Brupbacher et al. ('490) discloses that the matrix alloy is a titanium aluminide (col. 3, lines 48-58).

With respect to claim 17, Brupbacher et al. ('490) discloses that the composite material comprises silicon carbide and graphite as whisker material (col. 1, lines 30-43) in an amount of from less than 5 to greater than 90 volume percent (col. 4, lines 3-10).

With respect to claim 19, Brupbacher et al. ('490) in view of Gottselig et al. ('529) and further in view of Kugler ('412) does not specify the amounts of the complex carbide-silicide particles and the complex carbide-aluminide particles as claimed. However, Brupbacher et al. ('490) discloses that the total ceramic whisker loadings range from less than 5 to greater than 90 volume percents (col. 4, lines 3-10), which overlaps the claimed ranges.

With respect to claim 22, Brupbacher et al. ('490) discloses that ceramics and/or intermetallic hard particles dispersed in the matrix are incorporated into the titanium matrix composite during the preparation of a basic powdered blend (col. 1, lines 30-43 and Example 3).

Response to Arguments

4. The applicant's arguments filed on May 6, 2010 have been fully considered but they are not persuasive.

Applicant argues that 1) Gottselig et al. ('529) does not relate to titanium matrix composite at all and the claimed Ti_3SiC_2 would not absolutely obviously be formed during sintering in the presence of SiC and Ti; 2) Kugler ('412) does not relate to titanium matrix composite at all and an electrode comprising both titanium carbides and vanadium (or zirconium) aluminides will be destroyed by erosion soon; 3) nobody can control the reactions among the components of the initial powdered blend, therefore, the instant inventors include ceramic and/or intermetallic hard particles in ready form into the basic blend and 4) the prior art references do not disclose the instantly claimed titanium matrix composite having improved mechanical properties. The examiner notes that 1) the ground of rejection of the claimed titanium matrix composite relies on the teaching of Brupbacher et al. ('490) rather than that of Gottselig et al. ('529) and Gottselig et al. ('529) does teach the formation of Ti_3SiC_2 during sintering in the presence of SiC and Ti (abstract); 2) the ground of rejection of the claimed titanium matrix composite relies on the teaching of Brupbacher et al. ('490) rather than that of Kugler ('412) and Kugler ('412) does teach that the carbides of Brupbacher et al. ('490) in view of Gottselig et al. ('529) (e.g. TiC) and Al_8V_5 are functionally equivalent (col. 1, lines 34-40 and Example 2), therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the carbides of Brupbacher et al. ('490) in view of Gottselig et al. ('529) (e.g. TiC) with the claimed Al_8V_5 in the titanium matrix composite material of Brupbacher et al. ('490) in view of Gottselig et al. ('529) with an expectation of success, and Brupbacher et al. ('490) in view of Gottselig et al. ('529) and further in view of Kugler ('412) is not directed to an electrode

comprising both titanium carbides and vanadium (or zirconium) aluminides at all; 3) Brupbacher et al. ('490) discloses that ceramics and/or intermetallic hard particles dispersed in the matrix are incorporated into the titanium matrix composite during the preparation of a basic powdered blend (col. 1, lines 30-43 and Example 3); and 4) the mechanical and other properties of claimed and Brupbacher et al. ('490) in view of Gottselig et al. ('529) and further in view of Kugler ('412)'s discontinuously-reinforced titanium matrix composite materials would be similar as discussed above.

Conclusions

5. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/
Supervisory Patent Examiner, Art
Unit 1793

WZ

8/6/2010